

Springs, N. C. In the central part of the country Eureka Springs, Ark., led, with 14.67 inches, and in the far West, Helvetia, Ariz., with 11.27 inches.

SUNSHINE AND RELATIVE HUMIDITY

More than the average amount of sunshine was received in the central and northern plateau and Pacific coast regions, while much less than the normal amount for August was received in the central and southern portions of California, the southern plateau region, and in the far Southwest generally. Elsewhere sunshine was

near the average, but slightly above in the Great Plains and slightly below in the East generally. The relative humidity was above the normal in the far Southwest, the north Pacific region, the central Mississippi and Ohio Valleys, and the Northern and Central Atlantic States. However, in all cases the averages were but slightly above the normal. Elsewhere the humidity was generally below the average, with minus departures rather pronounced in portions of the upper Mississippi and the Missouri Valleys and the northern Rocky Mountain region.

SEVERE LOCAL STORMS, AUGUST, 1931

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path yards ¹	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Woodburn, Iowa (north-west of)	1	3 p. m.	33		\$500	Tornado	Corn and haystacks damaged; path 1 mile long.	Official, U. S. Weather Bureau.
Greenfield (near), Iowa	1	6 p. m.			5,250	do	Buildings and crops damaged.	Do.
Manhaska County, Iowa	1				1,000	Wind squall	Trees uprooted; corn and fences leveled; telephone communication interrupted.	Do.
Johnstown, Pa.	2	5:15 - 7:20 p. m.			125,000	Hail and rain	3 small bridges washed away; many basements flooded; 4 persons injured.	Do.
Prairieton (near), Ind.	2					Wind and rain	Sheds, barns and crops damaged; many trees blown down.	Do.
Overbrook (near), Kans.	3	7:09 p. m.	30			Small tornado	Minor damage to a few buildings; corn injured; path 1.5 miles long.	Do.
Saratoga Springs, Glens Falls, and North Troy, N. Y.	3				200,000	Electrical and wind	Hotel roof partially destroyed; damage to telephone, power lines and other property by falling trees.	Do.
Westport, Conn., and vicinity	3			1	75,000	Electrical, wind, hail and rain	Highways obstructed by fallen trees; wires blown down; windows and auto shields broken.	Hartford Times (Conn.).
Iuka, Kans., and vicinity	5	4:30 p. m.	880			Hail, rain and wind	Injury chiefly to corn; power lines damaged; path 3 miles long.	Official, U. S. Weather Bureau.
Big Horn and Yellowstone Counties, Mont.	7				435,600	Hail	Much loss to buildings and crops; livestock killed.	Do.
Dallas County, Iowa	7	3 p. m.			1,700	Wind, squall	Telephone and trees damaged; plate glass broken.	Do.
San Elizario (near), Tex.	8	do	2,640			Hail	Crops almost total loss.	Do.
Sturtevant, Wis.	8	5:15 p. m.			2,750	Wind, squall	Small farm buildings damaged; corn lodged.	Do.
Bucyrus (near), Ohio	8				1,000	Wind	Farm buildings and trees damaged; crops hurt.	Do.
Philadelphia, Pa., and vicinity north of	10	5-8 p. m.			100,000	Rain and electrical	Damage chiefly by flooding of basements and subway.	Do.
Reading, Pa.	10	P. m.			50,000	do	Mill partially destroyed; electric and telephone service crippled; crops leveled.	Do.
Between Woodfield and Etchison, Md.	10				5,000	Electrical	Large barn and contents destroyed.	Do.
Sheffield Lake Village, Ohio	11	10:30 p. m.	16-34		50,000	Probably tornado	Numerous cottages wrecked; overhead wires blown down; 10 persons injured.	Do.
Ramseyburg, N. Y.	12	9 a. m.	10			Wind	Trees uprooted; several farm buildings damaged.	Do.
Salt Lake City, Utah, and vicinity	13	P. m.			25,000	Heavy rain and wind	Gravel pit equipment, railways, highways, residence and business properties damaged.	Do.
McClain and Garvin Counties, Okla.	16	4 p. m.	2 mi.		10,000	Hail	Damage confined to crops; path 8 miles long.	Do.
Denver, Fort Lupton, and Hudson, Colo.	16				151,500	do	Extensive damage to crops and other property.	Do.
Polk County, Iowa	18	3 p. m.			3,000	do	Farm property damaged.	Do.
Concordia, Kans. (10 miles northeast)	18	5:30 p. m.	100		3,000	Small tornado	Damage chiefly to small farm buildings; path 1 mile long.	Do.
Due West, S. C.	18		7			do	Did not reach ground but crops directly under it were damaged.	Do.
Guthrie County, Iowa	19	4 p. m.	2 mi.			Wind and hail	Crops almost total loss in places; path 7 miles long.	Do.
Iowa County, Iowa	19				6,000	do	Buildings and crops damaged.	Do.
Filmore County, Nebr.	20	3-4 p. m.	3 mi.		35,000	Hail and wind	Chief damage to crops; a few windmills and trees blown down; path 18 miles long.	Do.
New Braunfels (near), Tex.	20	8:25 p. m.			500	Tornado and hail	Crops completely destroyed in small area; minor damage to buildings.	Do.
Richmond, Va.	20				20,000	Rain	Industrial plants flooded; walls, sidewalks, and pavements undermined; telephone service crippled.	Do.
Leesville (near), N. C.	21	3 p. m.			80,000	Wind and rain	Chief damage to crops.	Do.
Olton (near), Tex.	21	5 p. m.	2 mi.			Hail	Severe injury to crops; some stock loss.	Do.
Ione (near), N. Mex.	22	11 p. m.	2 mi.			do	Considerable damage, character not reported.	Do.
Chesapeake Bay and Eastern Shore, Md.	22-23					Wind and rain	Corn flattened; tomatoes damaged; fruit blown off; wires broken; boats driven ashore.	Do.
York and Seward Counties, Nebr.	25	3-4 p. m.	3 mi.		20,000	Hail and wind	Much crop damage; poultry killed; path 20 miles long.	Do.
Centrahoma to Atoka, Okla.	25	4:30 p. m.	880-3,520		14,000	Hail	Crops damaged; path 20 miles long.	Do.
Jefferson County, Nebr.	25	4:30-5 p. m.			60,000	do	Considerable crop loss.	Do.
Bryan County, Okla. (southwestern)	25	7 p. m.	1,760		26,000	do	Crops damaged; path 9 miles long.	Do.
Frederick County, Md.	25					Hail and wind	Corn stripped; trees blown down.	Do.
Lenoir City, Tenn.	26				10,000	Electrical	Residence destroyed.	Do.
Cerro Gordo County, Iowa	27	1-1:30 p. m.	25-34	1	180,000	Wind, hail, and tornado	Pavilion, theater, numerous cottages and trees damaged or wrecked; crops injured; path 7 miles long; tornado near Clear Lake; 21 persons injured.	Do.
Fayette County, Iowa	27	3:30 p. m.				Wind, hail, and electrical	Heavy crop loss; telephone service disrupted; 40 cows killed.	Do.
Buchanan County, Iowa	27	4 p. m.			10,000	Hail	Windows, roofs, and auto tops pierced; crops hurt; poultry killed.	Do.
Muscatine County, Iowa	27	5 p. m.	70		12,000	Wind and tornado	Tornado near Muscatine; damage on 3 farms; path 6 miles long.	Do.

¹ "Mi." signifies miles instead of yards.

SEVERE LOCAL STORMS, AUGUST, 1931—Continued

Place	Date	Time	Width of path yards ¹	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Bushton (near), Ill.....	27	5 p. m.....	2,640	-----	13,000	Hail.....	Crops and roofs damaged; glass broken; path 3 miles long.	Official, U. S. Weather Bureau.
Charleston, S. C. (north of).....	27	6 p. m.....	-----	-----	1,500	Thunderstorm and wind.	Damage to crops and outhouses.....	Do.
Rock County northeastward to Lake Michigan, Wis.....	27	7 p. m.....	-----	-----	-----	Thunderstorm and wind squalls.	Trees uprooted; poles and overhead wires blown down; corn lodged.	Do.
Chickasaw, Floyd, Scott, Wright, and Delaware Counties, Iowa.....	27	P. m.....	-----	-----	-----	Wind and hail.....	Crops, roofs, farm buildings and equipment, and trees damaged.	Do.
Delphi, Ind. (3 miles west).....	27	..do.....	-----	-----	5,000	Small tornado.....	Barn and several small buildings wrecked; trees blown down.	Do.
Linn and Jackson Counties, Iowa.....	27	..do.....	-----	-----	-----	Wind, rain and flood.	Sewers and cellars flooded; wires damaged; railway track and 8 bridges washed out.	Do.
Jo Daviess, Carroll, Lake, and Whiteside Counties, Ill.....	27	-----	-----	-----	-----	Wind and electrical.	Number of buildings struck; barns burned; stock killed; wire services crippled; orchards hurt.	Do.
Norwich, Oneonta, and Goshen, N. Y.....	27	-----	-----	-----	-----	Heavy rain.....	Basements and low lands flooded.	Do.
Providence, R. I., and vicinity.....	27-28	-----	-----	-----	-----	Thunderstorm.....	12 houses struck by lightning; many telephones out of order.	Do.
Sparta, Ill., and vicinity.....	28	2 a. m.....	20-30	-----	50,000	Probably tornado.....	Roofs torn off; two-story brick building practically demolished; windows and walls pushed out.	Do.
Carlsbad (near), N. Mex.....	28	4 p. m.....	1,760	-----	32,000	Hail.....	Much cotton destroyed or damaged.	Do.
Emmitsburg, (near), Md.....	28	P. m.....	-----	-----	10,000	Thunderstorm and wind.	Garage and small buildings burned or wrecked; trees uprooted.	Do.
Yuma, Ariz.....	29	-----	-----	-----	-----	Hail, wind, and rain.	Skylights, windows, and trees broken; small farm buildings demolished; cotton hurt.	Do.
Benton, Black Hawk, Carroll, Marshall, Story, and Monroe Counties, Iowa.....	31	6:10 p. m.....	-----	-----	44,000	Wind.....	Buildings, crops, trees, and overhead wires damaged.	Do.
Riley County, Kans.....	31	6:30 p. m.....	6 mi.	-----	50,000	Wind and hail.....	Barn and pavilion wrecked; crops damaged; windows and light globes broken; roofs pierced; 1 person injured; path 7 miles long.	Do.
Volland to Maple Hill and Eskridge, Kans.....	31	9:45 p. m.....	2-10 mi.	-----	25,000	..do.....	Windows broken; roofs and crops damaged; path 25 miles long.	Do.
Southeastern counties, Wis.....	31	P. m.....	-----	-----	12,000	Wind, squalls, thunderstorm, and hail.	Considerable damage to farm properties; tobacco injured.	Do.

¹ "Mi." signifies miles instead of yards.

RIVERS AND FLOODS

(River and Flood Division, Montrose W. Hayes in Charge)

By RICHMOND T. ZOCH

Important overflows occurred in the southeastern part of the country and in the Colorado River basin. The accompanying table of floods shows the crests reached.

Damage was reported as follows: In the Roanoke River system, \$7,000; in the Neuse River system, \$8,000; in the Cape Fear River system, \$5,000; in the Pee Dee River system, \$3,000; and in the Colorado River system, \$3,000. The damage caused by high water in the Pearl River system was given in the July issue of the MONTHLY WEATHER REVIEW. There were no reports of losses received from the Tar or Santee River systems.

The value of property saved by warnings was, along the Roanoke River, \$16,000; the Tar River, \$1,000; the Neuse River, \$6,000; the Cape Fear River, \$8,000; and the Pee Dee River, \$25,000.

Heavy local rains resulting in overflows in small streams, where it is impracticable to maintain a warning service, caused damage as follows: On August 1, \$100,000 around Helena, Mont., and \$50,000 around Sioux City, Iowa; and on August 13, \$25,000 around Salt Lake City, Utah. Other overflows in small streams were reported, but the extent or amount of damage was not given.

Most of the rivers of the Mississippi system, except those in the Ohio basin, were at the lowest stages ever recorded in a summer month. Most of the rivers in California were also extremely low.

Table of flood stages in August, 1931

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
Roanoke:	<i>Feet</i>			<i>Feet</i>	
Randolph, Va.....	21	23	24	21.4	24
Weldon, N. C.....	30	24	25	34.1	25
Scotland Neck, N. C.....	23	13	13	23.0	13
		24	26	25.2	26
Williamston, N. C.....	9	13	19	9.8	18
		26	31	9.9	30
Fishing Creek: Enfield, N. C.....	15	13	15	18.4	14
Tar: Rocky Mount, N. C.....	9	13	13	9.2	13
Neuse:					
Neuse, N. C.....	15	5	6	17.0	5
		1	2	14.5	2
Smithfield, N. C.....	14	5	8	19.0	7
		12	17	16.8	13
		23	23	14.0	23
Cape Fear:					
Fayetteville, N. C.....	35	23	24	36.2	23
Elizabethtown, N. C.....	22	14	16	22.7	16
		22	26	29.0	24
Peedee:					
Cheraw, S. C.....	27	22	23	30.0	23
Mars Bluff Bridge, S. C.....	17	24	30	19.5	27
Poston, S. C.....	18	29	31	18.9	30, 31
Santee: Rimini, S. C.....	12	12	18	13.0	14, 15
		30	30	12.0	30
EAST GULF OF MEXICO DRAINAGE					
Pearl: Jackson, Miss.....	20	19	10	26.4	5
GULF OF CALIFORNIA DRAINAGE					
Gila: Gila Bend, Ariz.....	5	10	11	7.5	11
Colorado: Parker, Ariz.....	7	6	6	9.5	6

¹ In July.

All dates are in August, unless otherwise indicated.